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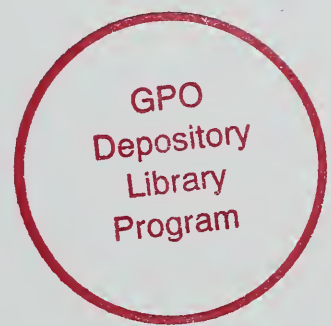
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TIMBER SUPPLY AND DEMAND 1995

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■ *Alaska National Interest Lands Conservation Act*
Section 706(a) Report to Congress
USDA Forest Service, Alaska Region



Report Number 15 - January 1996



United States
Department of
Agriculture

Prepared By
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Preface

This is the fifteenth report prepared in accordance with Section 706(a) of the Alaska National Interest Lands Conservation Act (ANILCA), which requires the Secretary of Agriculture to monitor and report annually on timber supply and demand in Southeast Alaska. The following pages provide a summary of timber sale activity in the region and a review of the primary factors affecting timber markets in fiscal year 1995.

As required by Section 706(a) of ANILCA, this report was prepared in consultation with representatives from the State of Alaska, the affected Native Corporations, the Southeast Alaska timber industry, the Southeast Alaska Conservation Council, and the Southeast Alaska commercial fishing industry.

Copies of this report have been submitted to the Committee on Energy and Natural Resources of the U.S. Senate and the Committee on Natural Resources of the U.S. House of Representatives. Additional copies may be obtained by writing to:

Director of Ecosystem Planning and Budgeting
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Executive Summary

- ***APC Announces Wrangell Mill Closure***

Alaska Pulp Corporation (APC) announced the indefinite shutdown of the Wrangell mill, effective November 30, 1994. With a log capacity of 110 MMBF, the Wrangell mill was the largest sawmill in the region and employed 230 people. The mill was also pivotal in the Wrangell economy, accounting for 22 percent of the wage and salary employment and 31 percent of the community's total payroll. A number of the mill employees had worked there for over 30 years. The mill was established in the 1920's, but ran only intermittently until APC (formerly Alaska Lumber and Pulp Company) took over management in the late 1950's.

- ***Tongass Timber Availability***

Timber sale purchasers in Southeast Alaska harvested 221.1 million board feet (MMBF) of timber from the Tongass National Forest in FY 1995¹. This was the lowest level of timber harvest on the Forest since 1963. The amount of timber harvested under the long-term contracts (161.9 MMBF) dropped 29 percent from FY 1994 harvest levels. Most of the volume was harvested by KPC (146.1 MMBF) with the remaining volume (15.8 MMBF) accounted for by activity under the former APC contract. In contrast, the volume of timber harvested under the independent sale program (59.2 MMBF) increased 23 percent.

The Forest Service offered a total of 326.6 MMBF of timber for sale in FY 1995. Of this, 110.2 MMBF was offered under the short-term, or independent, sale program and 216.4 MMBF was fully prepared for offer under the long-term timber contract with Ketchikan Pulp Company (KPC). The volume of timber actually available to the industry was considerably less, however, because 125.5 MMBF of the volume prepared was under court injunction. As a result, the net sale volume available for purchase in FY 1995 included 42.4 MMBF of independent sales and 158.6 MMBF of KPC long-term contract offerings. Relative to FY 1994, 62 percent less timber volume was offered and available under the independent sale program and 27 percent less timber volume was offered and available under the KPC long-term contract. Approximately 36.5 MMBF (86 percent) of the available independent sale volume was offered during the last month of FY 1995.

- ***Stumpage Prices Remain High***

Stumpage prices (the value of standing timber) for Tongass timber remained high in FY 1995, with bid averages for independent sales running 19 percent over appraised rates. Final bid values for independent sales ranged from \$23.01 per thousand board feet (MBF) to \$341.70/MBF with an average of \$278.97/MBF. Excluding purchaser road credits, final bids averaged \$54.96/MBF. Prices paid for timber harvested under the long-term contracts averaged \$120.75/MBF for KPC and \$141.59/MBF for APC. Excluding purchaser road credits, price averages for the long-term sales were \$48.72/MBF and \$1.29/MBF, respectively.

1 Unless otherwise noted, timber volumes in this report are inclusive of utility volume.

- **Timber Industry Employment Continues to Decline**

The closure of the Wrangell sawmill and temporary layoffs in other small mills have reduced timber industry employment in Southeast Alaska to a decade low. An average of 301 persons were employed in sawmills during 1995, a drop of 50 percent from the industry peak in 1991 and down 42 percent from last year. The pulp mill in Ketchikan continued to operate throughout the fiscal year, maintaining stability in pulp industry employment. Logging employment also appeared to have stabilized, as the average of 1,185 jobs was only slightly above last fiscal year. In comparison with the decade average of 2,753 (1985-1995), average annual employment in all sectors of the timber industry has declined by 27 percent.

- **Mixed Markets for Sawnwood Products**

Export prices for sawnwood products (dimension lumber, cants, flitches, etc.) continued to climb throughout FY 1995, reflecting tight wood supplies and the unprecedented decline of the value of the U.S. dollar in relation to the Japanese yen. The average price paid for Alaska's sawnwood exports was \$702 per thousand board feet, an increase of 27 percent over FY 1994. In contrast, price averages in the domestic market were down 18 percent. An estimated 88 percent of Alaska's sawnwood products are exported, with the remainder destined for ports in the Pacific Northwest. Japan is Alaska's primary market for sawnwood products, receiving 96 percent of the export value in FY 1995.

- **Pulp Market Surges to Record High**

Dissolving pulp prices soared in FY 1995 with quarterly price hikes continuing throughout the fiscal year. The average price for Alaska's pulp exports hit a record high of \$915/metric ton in FY 1995. There are several indications that dissolving pulp markets will remain strong over the next few months. First, mill closures and market-related shutdowns have helped to curb the oversupply in world markets. Second, the market for paper-grade pulp has made a phenomenal comeback since the end of 1993, and quarterly price hikes of \$60-\$70/ton have narrowed the gap between paper and dissolving pulp prices. Thus, the impetus for mill conversion appear very strong. Third, a poor cotton crop has raised cotton prices, shifting market focus to rayon and cotton substitutes. Fourth, new technology to produce the solvent spun cellulosic fiber known as *lyocell* may provide further growth for dissolving pulp demand. Finally, the general improvement in world economies is likely to boost demand for dissolving pulp in the traditional product lines of rayon and acetate.

Introduction

Section 706(a) of the Alaska National Interest Lands Conservation Act (ANILCA) directs the Secretary of Agriculture to monitor and report annually on timber supply and demand in southeastern Alaska. Accordingly, this report describes the status of the timber market in Southeast Alaska during the 1995 federal fiscal year (October 1, 1994 - September 30, 1995).

For purposes of this report, timber supply is defined as the trees most readily available for processing or export in Southeast Alaska. This includes the sum of: 1) timber advertised and timber purchased competitively under the Forest Service short-term sale program; 2) timber made available from State and private ownerships; and 3) timber fully prepared for release and timber released under the long-term timber contract between the Forest Service and Ketchikan Pulp Company (KPC). The amount of federal timber in various stages of sale preparation is referred to as the "timber pipeline" and is discussed in this report with regard to timber availability in future years.

The demand for timber in Southeast Alaska is determined by the number, capacity, and efficiency of wood processors in the region, the type and value of products manufactured, the technology employed in manufacturing those products, and the cost of available wood supplies. Ultimately, the interaction of all these factors will result in the harvest (and import) of timber by processors and exporters in the region. This report monitors the volume of timber purchased, harvested, consumed, and exported each year, all of which are indicators of the demand for timber in Southeast Alaska. Some of these measures necessarily include timber supplied from non-federal ownerships in the region and/or timber imported from foreign or domestic sources. In addition, the rate at which timber is purchased and harvested ultimately depends on the demand for the wood products manufactured. Thus, changes in the wood products industry in Southeast Alaska and trends in primary wood product markets are also reviewed in this report.

Timber Supply

Tongass Timber Program Overview - FY 1995

The Forest Service prepared 326.6 million board feet (MMBF) of timber to be offered during FY 1995. Although nearly equivalent to FY 1994 offer levels, timber harvest activity was enjoined on 125.5 MMBF of the volume prepared for offer this year, reducing the amount actually available to industry to 201.1 MMBF. Of this available volume, 42.4 MMBF was offered under the independent sale program and 158.6 MMBF was fully prepared for release to KPC (Table A-16).

A total of 102.0 MMBF of short-term timber sales were sold in FY 1995, nearly double the volume sold under this program in FY 1994. The total included approximately 96 MMBF of timber that was offered at the end of FY 1994. A total of 158.6 MMBF was released under the KPC long-term contract in FY 1995, 27 percent less than the volume released last fiscal year (Table A-2).

Timber sale operators harvested 181.3 MMBF of sawtimber and 39.8 MMBF of utility grade logs for a total harvest volume of 221.1 MMBF in FY 1995. Of this, an estimated 40 percent was sawn, 45 percent pulped, and the remaining 15 percent was exported. The amount of timber harvested under the long-term contracts (161.9 MMBF) dropped 29 percent from FY 1994 harvest levels. Most of the volume was harvested by KPC (146.1 MMBF) with the remaining volume (15.8 MMBF) accounted for by activity under the former APC contract. The volume of timber harvested under the independent sale program (59.2 MMBF) increased by 23 percent relative to FY 1994.

Purchasers of National Forest timber started the fiscal year with approximately 298.4 MMBF of volume under contract, i.e. sold but not yet harvested. Of this, 93.6 MMBF was under contract to independent purchasers and 204.7 MMBF was available under the KPC long-term contract (Table A-17).

Factors Influencing Timber Supply from the Tongass in FY 1995

In an order filed March 23, 1995, the U.S. Court of Appeals for the Ninth Circuit temporarily enjoined the Forest Service from proceeding with any logging, road-building, or other associated activity on four specific timber sales. The injunction halted the planned harvest of approximately 94.8 MMBF of the timber offered in FY 1994, including 40.9 MMBF of timber held under the KPC long-term contract and 53.8 MMBF of timber held under independent contracts. The order also enjoined the offer or award of any further timber sales resulting from the termination of the Alaska Pulp Corporation (APC) long-term contract, pending appeal.

The injunction was entered in a lawsuit filed by the Alaska Wilderness Recreation and Tourism Association (AWRTA), the Organized Village of Kake, the Southeast Alaska Conservation Council, the Natural Resources Defense Council, and the Wilderness Society. The injunction followed a February 27, 1995 ruling against these plaintiffs by the U.S. District Court for the District of Alaska. The suit brought by these plaintiffs challenged the decision by the Forest Service to offer, as independent sales or KPC long-term contract offerings, timber sale projects that were originally prepared to satisfy the volume requirements of the APC long-term timber contract.

On July 24, 1995 the Court of Appeals overturned the District Court decision, extended the temporary injunction, and instructed the District Court to determine whether and in what form an injunction should con-

timber pending completion by the Forest Service of further National Environmental Policy Act (NEPA) and ANILCA section 810 compliance procedures. A total of 125.5 MMBF of timber scheduled to be offered in FY 1995 was delayed by the court injunction, including 67.7 MMBF in independent sales and 57.8 MMBF of volume scheduled for release to KPC. This was in addition to the FY 1994 offerings listed above which continued to remain under injunction at the end of FY 1995.

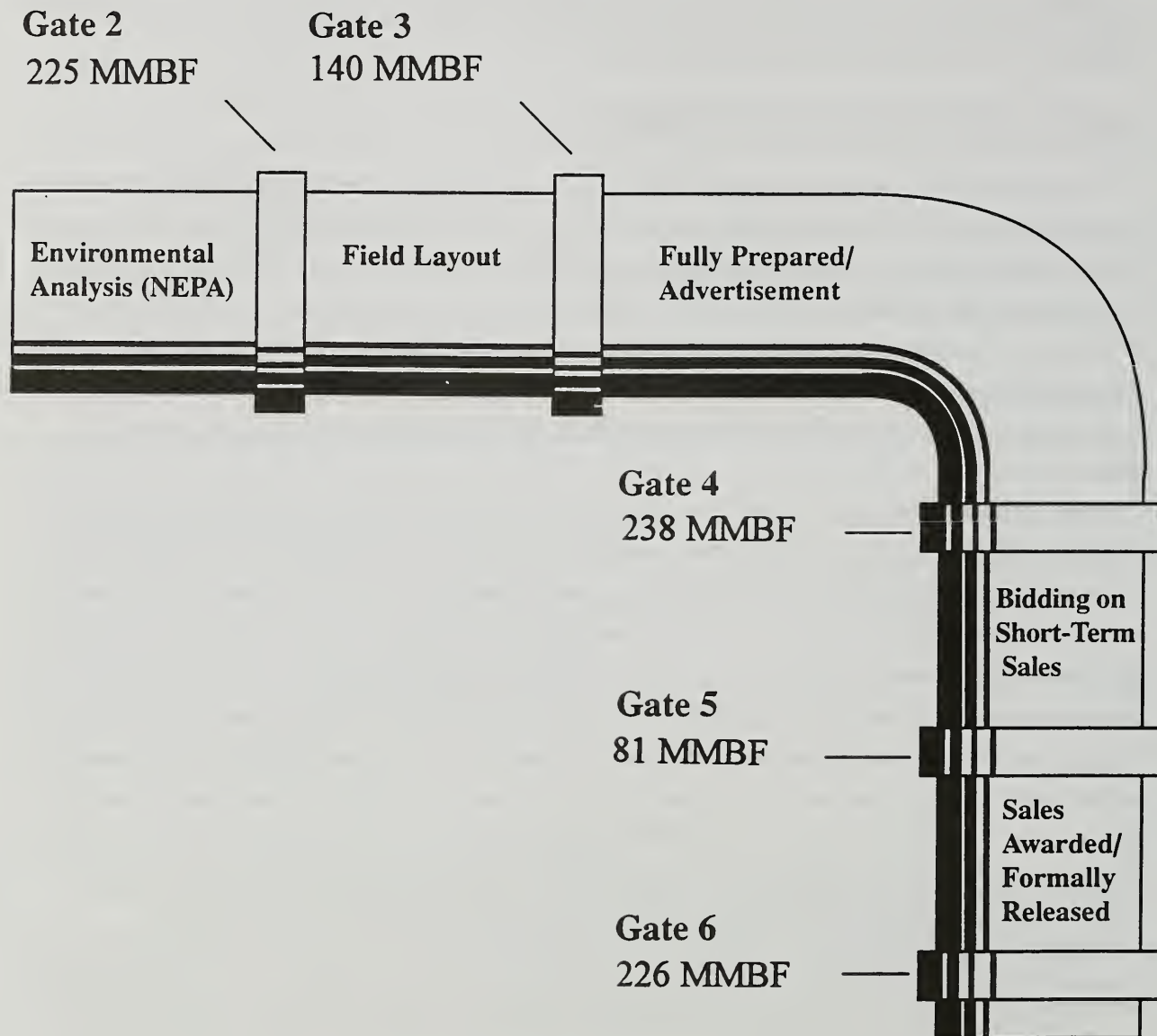
Status of the Tongass Timber Pipeline

At any point in time, varying amounts of timber from the Tongass National Forest are in different stages of readiness for harvest. Each stage is referred to as a "gate," and is defined by specific activities to be completed by the Forest Service before the associated timber volume can pass on to the next gate. Completion of six different gates is required. The sequence of gates numbered two through six is commonly referred to as the timber "pipeline" which serves as a link between timber inventory and timber available for harvest. Although it usually takes three to five years to move a timber sale through the pipeline, timber sale administrative appeals or lawsuits can delay sale preparation and require adjustments to out-year planning schedules.

Standing timber purchased from the Forest Service is referred to as "volume under contract". Timber processors generally have some volume under contract that is carried over from one year to the next. This gives them a "pool" of wood to use to bridge the gap between the time a sale is purchased and the time harvest activities can begin. For instance, it can take an operator six months or more to complete the road construction needed to gain access to a new sale area. While this is happening, the purchaser can be harvesting last year's carry-over volume. The Forest Service attempts to maintain the industry's pool at a level equal to approximately three years of harvest activity. At the close of FY 1995, 46.5 MMBF of timber was under contract and available to independent operators and an additional 53.9 MMBF was under contract and enjoined. At the same time, a total of 179.9 MMBF of timber was released and remained unharvested under the KPC long-term contract (although 88.6 MMBF of this volume was not released until September 25, 1995). An additional 40.9 MMBF of volume was released to KPC but is under court injunction.

Figure one illustrates the timber pipeline at the end of FY 1995. In its entirety, the timber sale program involves a much greater volume of timber than the amount offered for sale each year. For example, in FY 1995, the environmental analysis required under NEPA had been completed for project areas including some 1,277 MMBF of timber. This figure represents over three times the annual amount of timber that has been offered for sale in recent years. Only a portion of the total volume of timber in the pipeline is readily available. Sale preparation and the site-specific layout of cutting units must be completed before 194 MMBF of the total "NEPA-cleared" timber sales can be advertised. In addition, part of the timber volume offered this year (i.e. volume cleared through gates 4 or 5) has not been sold or released yet (354 MMBF). The remaining 319.1 MMBF of timber in the pipeline has been awarded or released to purchasers (i.e. cleared through gate 6) and usually represents the most readily accessible supply for the industry. Timber sold in prior years that has not been harvested is included as part of this supply. A court injunction, discussed previously, prohibited the harvest of 94.8 MMBF of timber otherwise awarded or released to purchasers. The injunction also prohibited the offer or award of an additional 125.5 MMBF of timber in FY 1995.

**FIGURE 1. Tongass National Forest Timber Pipeline
September 30, 1995**



Note: See FSH 2409.18 for more information about the steps in timber sale preparation.

Other Sources of Timber

The bulk of the wood processed in Southeast Alaska comes from the Tongass National Forest. This is the result of two primary factors. First, federal timber is prohibited by law from being exported without local processing, except for cedar which constitutes a small fraction of Tongass timber. Second, in comparison to the prices local processors are willing to pay, unprocessed logs tend to bring much higher revenues if they are sold in international markets. Consequently, non-federal suppliers export as many logs as possible, leaving primarily Tongass timber to supply local mills.

Southeast Alaska Native Corporations. The 1971 Alaska Native Claims Settlement Act established thirteen Native Corporations in Southeast Alaska and entitled them to select some 600,000 acres of land from the Tongass National Forest. Approximately 10 percent of the non-reserved standing timber volume in the region was conveyed to the corporations and, since 1983, timber removals from Native Corporation lands have exceeded the level of harvest on the Tongass National Forest. Therefore, in purely physical terms, there has been an ample timber supply for local manufacturers. However, as a result of the higher prices paid for round logs in the export market, most timber from Native lands is shipped "in the round" (i.e. without processing) to foreign destinations.

The contribution of Native timber to the supply available for local manufacture is also a function of the relative strength of pulp and lumber markets and the price and availability of timber from other sources. In the mid-1980s, for example, most Native pulp logs were left in the woods during harvest activities because the soft pulp market reduced their value. At the same time, imports of lower-cost logs from Canada added to the displacement of Native pulp logs in local markets. By the end of the decade, pulp production had increased in response to improved market conditions, and the demand for Native timber supplies was renewed.

State Timberlands. The Alaska Department of Natural Resources manages the State's commercial forest lands in Southeast Alaska. There are approximately 58,000 acres of State land available for timber management in the Haines vicinity and another 3,000 acres near Yakutat². Most of the available timber is located on lands that were subject to selection under the State's Mental Health Trust settlement. After several years of inactivity pending the resolution of legal issues, the timber sale program on the Haines State Forest was resumed in 1992. A primary objective for the sales prepared in this area is the salvage of timber infested by the spruce bark beetle. Unlike federal timber, there is no requirement to process State timber in Alaska, and most logs move directly into export markets.

Log and Chip Imports. In the early eighties, Canada's efforts to maintain logging employment despite the depressed pulp market, generated a surplus of pulp logs in British Columbia (B.C). Consequently, Canadian pulp logs could be imported for about half the price of the raw material available in Southeast Alaska. The coincident strengthening of the U.S. dollar against Canadian currency provided an added incentive for mills in Southeast to turn to Canada for raw material. In recent years, only minor log import activity has occurred in Southeast, in part due to the considerable rise in log values. Also, in response to growing land use conflicts, the need for watershed protection, and increased resistance to clearcutting, the Canadian government has deemphasized round-log export in favor of sending out more finished products.

Nevertheless, as can be seen in FY 1995 trade statistics, there are occasional opportunities for acquiring wood fiber from Canada. Ironically, the extensive search for pulp fiber in 1995 caused shipments of pulp logs and chips to literally "pass each other in the night", as fiber from Southcentral Alaska fed B.C. pulp mills at the same time the Ketchikan pulp mill was collecting pulp logs and chips from Canada. Trade sta-

² Alaska State Department of Natural Resources, Division of Forestry, "Outlook for Supplying Timber to Small Loggers and Southeast Mills in Alaska", 1982.

tistics compiled from U.S. Department of Commerce indicate that about 94 metric tons of softwood chips were imported into Southeast Alaska during the last half of 1995, at a record price of \$215/ton. Approximately 1.2 MMBF of pulp logs were also imported from Canada during FY 1995. At the same time wood was flowing into Southeast Alaska, an estimated 78.3 MMBF of pulp logs were shipped out of Southcentral Alaska to pulp mills in B.C. In some cases, this required trucking the logs a distance of over 100 miles before loading them on barges for shipment at the Port of Valdez.

Timber Demand

As a general concept, a demand curve relates the quantity of a commodity purchased to its price. However at least four types of such relationships are commonly found in the literature, including: 1) an individual's demand for a commodity or service; 2) the collective or aggregate demand of all consumers for the output of the industry; 3) the "derived demand" for intermediate goods which will enter into further production; and 4) the demand for the output of a particular firm in the industry. With regard to the fourth measure, if a firm is a pure competitor, it is by definition such a small element in the industry's market that any increase in its output has no discernable effect on price. Therefore, price simply remains constant as the firm expands output and the firm's demand curve is a straight line.

The following pages provide summary statistics on the volume of timber purchased, harvested, consumed (and exported) within Southeast Alaska all of which are indicators of the timber demand. Some of these measures necessarily include timber supplied from non-federal ownerships in the region and/or timber imported from foreign or domestic sources. In addition, the rate at which timber is purchased and harvested ultimately depends on the demand for the wood products manufactured. Thus, changes in the wood products industry in Southeast Alaska and trends in primary wood product markets are also reviewed here. This report is intended to monitor timber markets and makes no attempt to speculate on what may have transpired if the numerous factors influencing the demand for timber had somehow been altered. As a result, it is technically a report on the quantity of timber demanded in FY 1995, given the cost of alternative supplies and the prevailing market conditions.

Quantity of Timber Consumed and Exported in FY 1995

Table 2 lists the larger wood products manufacturers operating in Southeast Alaska during FY 1995, the installed mill capacity as reported by the mill operators, and the estimated log consumption in FY 1995. Log export volumes are also reported to provide a complete accounting of the quantity demand for timber in FY 1995. It is important to note that mill capacity alone does not constitute market demand. However, it does set an upper limit on roundwood consumption in the short run. As shown below, total wood consumption in FY 1995 was 302 MMBF. Excluding chip by-products, the quantity of timber consumed in Southeast Alaska was 250 MMBF. Log exports accounted for an additional 313 MMBF.

Although a very small amount of cedar is sawn, it is not used in the KPC pulp mill and most cedar logs are shipped overseas under special export exemption (Table A-3). Therefore, to the extent cedar volume is included in estimates of timber supply, the volume available for local processing under current use patterns

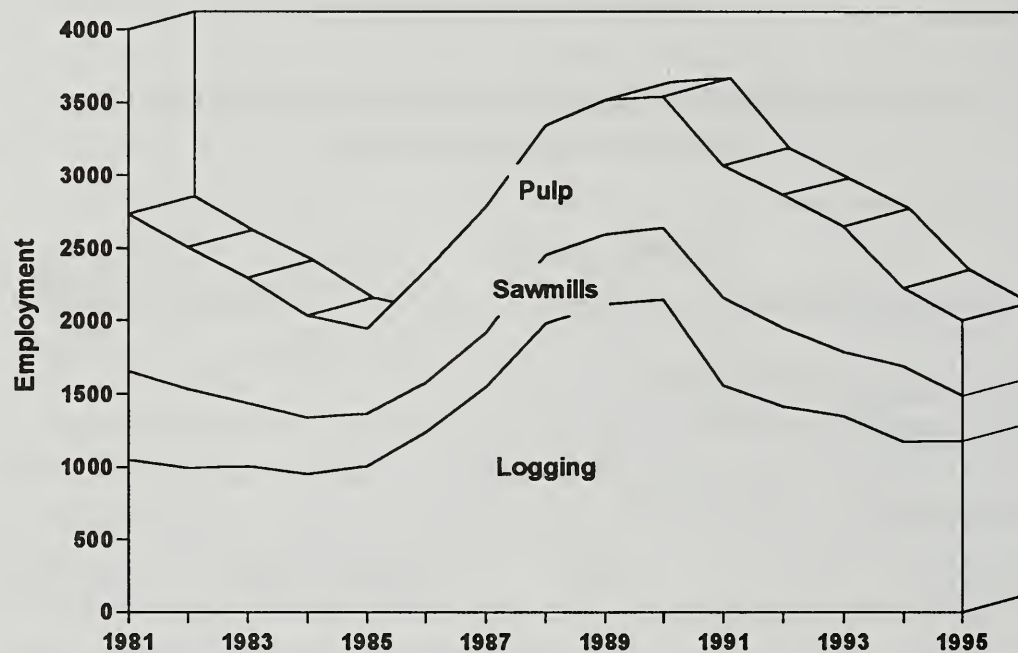
will be overstated. For example, if cedar accounted for 12 percent of the available timber volume, roughly 284 MMBF of timber would have been harvested to obtain the quantity of spruce and hemlock logs consumed this year.

**TABLE 2. ESTIMATED TIMBER CONSUMPTION AND EXPORT
SOUTHEAST ALASKA FY 1995**

	Installed Capacity (MMBF)	Wood Fiber Consumed FY 1995 (MMBF equiv.)	Percent Capacity Utilized FY 1995
Long-Term Contract:			
Annette Sawmill	60	50	83 percent
Ketchikan Sawmill	50	30	60 percent
KPC Pulp Mill	190	92 logs/52 chips	76 percent
Independent Operators:¹			
Seley Corp.	35	30	86 percent
Viking Lumber	30	20	60 percent
Other Small Mills	62	28	45 percent
Total Mill Capacity	427		
Subtotal Log Consumption:		250 logs/ 52 chips	71 percent
Log Exports:		313	
TOTAL		615	
/1 Capacity as reported by mill owners. Consumption estimated.			

The Wood Products Industry In Southeast Alaska

Since 1928, when the Forest Service established requirements to process National Forest timber within Alaska, the Tongass timber program has been part of an ongoing effort to provide greater economic diversity in Southeast Alaska and the opportunity for year-round employment. Timber supply alone cannot ensure employment stability, however, as indicated by periodic declines in the timber-related sectors of the Southeast Alaska economy (Figure 2 and Table A-1). Other important factors include economic conditions in Alaska's primary markets, the strength of other competitors for those markets, and the development and acceptance of wood-product substitutes. Employment may also be reduced when equipment is upgraded for increased efficiency.

FIGURE 2. Annual Average Employment in Wood Products Industries - Southeast Alaska

Industry Update

Alaska Pulp Corporation (APC) announced the closure of the Wrangell sawmill shortly after the start of the 1995 fiscal year. With a log capacity of 110 MMBF, the Wrangell mill was the largest sawmill in the region and employed 230 people. The mill was also pivotal in the Wrangell economy, accounting for 22 percent of the wage and salary employment and 31 percent of the community's total payroll. A number of individuals at the mill had worked there for over 30 years. The mill was established in the 1920's, but ran only intermittently until APC (formerly Alaska Lumber and Pulp Company) took over management in the late 1950's.³

The Ketchikan Pulp Company (KPC) holds the sole remaining long-term Forest Service contract for Tongass timber. As specified in contract number A10FS-1042 (dated July, 1951), KPC secured cutting rights to up to 8.25 BBF of National Forest timber, with a sale area designated on the northern half of Prince of Wales Island and the northwest portion of Revillagigedo Island. KPC built, and continues to operate, a dissolving pulp mill in the community of Ketchikan, near the southern end of the Tongass National Forest. At full capacity, the mill reportedly requires 190 MMBF of pulpwood and chips annually to produce 190,000 metric tons (210,000 tons) of dissolving pulp. According to KPC, pulp production during the 1995 federal fiscal year totaled 149,130 metric tons (164,389 tons) or 78 percent of mill capacity. The company reports that the mill was shut down a total of 29 days during FY 1995.⁴

³ Buchanan, Rober K., *The History, Growth, Use and Future Development of the Timber Industry of Southeastern Alaska*, Unpublished Thesis, University of Washington, May 1969, 129 pp.

⁴ Debbie Crumpton, KPC, FAX transmittal, November, 1995.

Two sawmills located at Ketchikan and Annette Island are also owned by KPC. They reportedly have a combined log processing capacity of 110 MMBF. The Ketchikan sawmill was opened in 1989, and is specially designed for the manufacture of finished lumber from small-diameter logs (7-18 inches). The Ketchikan sawmill was closed temporarily midway through year and processed 30 MMBF of logs during FY 1995.⁵ The Annette Island Hemlock sawmill and its associated chip mill are also operated by KPC under a lease agreement with the Metlakatla Indian Community. The Annette mill is set up to process large-diameter logs (18-65 inches) which are becoming increasingly difficult to obtain. This sawmill typifies early timber operations in Southeast Alaska, as it produces only rough lumber, primarily cants. KPC reduced operations at the Annette mill to a single shift in FY 1995 and reports that the mill ran at 83 percent of capacity throughout the year, processing approximately 50 MMBF of sawlogs.⁶

In addition to supplying timber under the long-term contracts, the Forest Service participates in a Small Business program in conjunction with the Small Business Administration (SBA). Under this program, a target volume of 80 MMBF each year has been planned for offer to qualified small businesses in Southeast Alaska. In FY 1995, 24.8 MMBF (23 percent) of the independent sales offered were SBA-designated. At least 50 percent of the wood offered for sale under SBA sales must be manufactured by a firm of 500 employees or less. The largest SBA-certified firms currently bidding on timber sales from the Tongass National Forest include Seaborne Lumber (owned by Seley Corporation), Sealaska, Klukwan Forest Products, and Silver Bay Logging. These firms contract with some of the sawmills described below to manufacture green lumber for the export market.

Seaborne Lumber, located in Ketchikan, custom cuts logs for Sealaska Native Corporation and other purchasers of federal timber. The mill opened in July 1993, employs 62 people, and has an estimated log capacity of 35 MMBF. On September 1, 1995, 27 workers were laid off at the mill as production was reduced to a single shift.⁷ The Metlakatla Indian Tribal Enterprises (MITE) sawmill was built in 1993 to provide lumber for tribal members while allowing limited resale opportunities. Mill capacity is estimated at 10 MMBF. After a period of remodeling and reconstruction, the MITE mill reopened this summer and currently employs 20 people.⁸ The Pacific Rim Cedar mill has a wood processing capacity of about 10 MMBF. The mill employs 14 people in Wrangell to custom cut lumber and cants for export markets. The mill closed at the end of October 1995, reportedly due to a shortage of timber.⁹

Viking Lumber recently renovated the sawmill in Klawock, adding computerized equipment and installing a whole-log chipper. Although the target throughput of 30 MMBF is considerably less than the mill's original capacity (70 MMBF), mill personnel report that their emphasis on quality products mandates a slower processing rate. The end products of this mill are destined for secondary processing (remanufacture into door and window components, molding, etc.) elsewhere in the United States. The mill currently employs 35 people.

National direction grants District Rangers the authority to conduct sales of 5 MMBF or less. Commonly referred to as "ranger" sales, these smaller timber offerings include cedar salvage, hand-picked quality mu-

⁵ Crumpton, November, 1995.

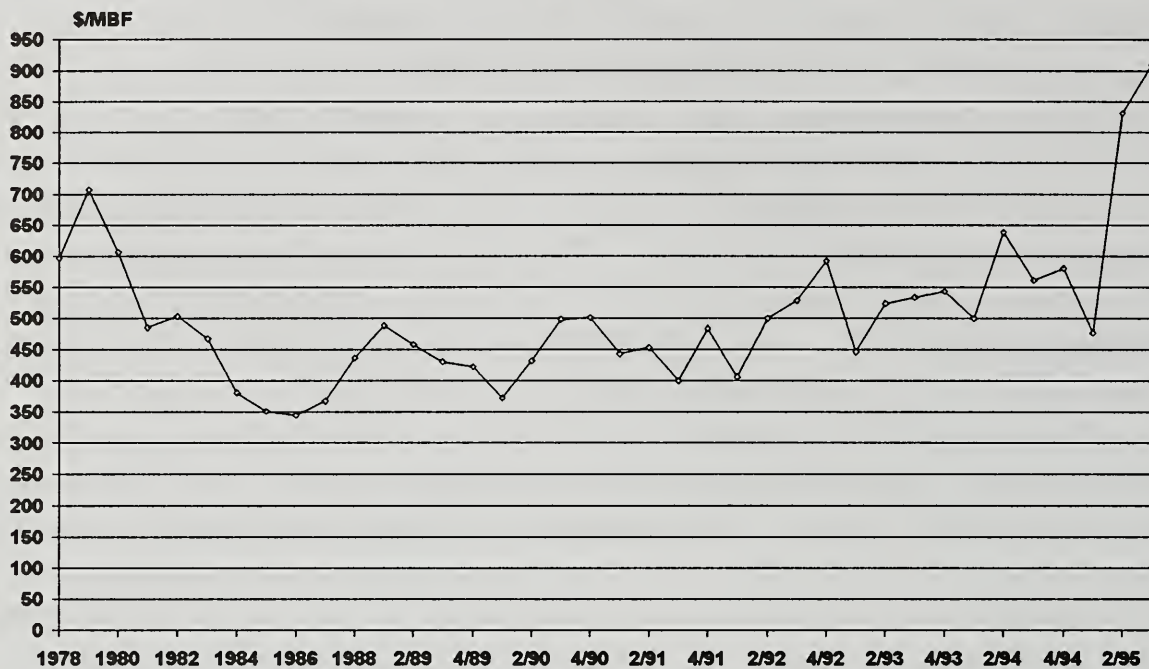
⁶ Crumpton, November, 1995.

⁷ Personal communication with Carl Smith, mill manager, November 24, 1995.

⁸ Alaska Lumbermen's Association, Memorandum on the Capacity of the Southeast Alaska SBA Mill Operations, June 14, 1994.

⁹ Personal communication with Frank Age, mill owner, November 13, 1995.

FIGURE 3. Alaskan Lumber Exports – Average Unit Value



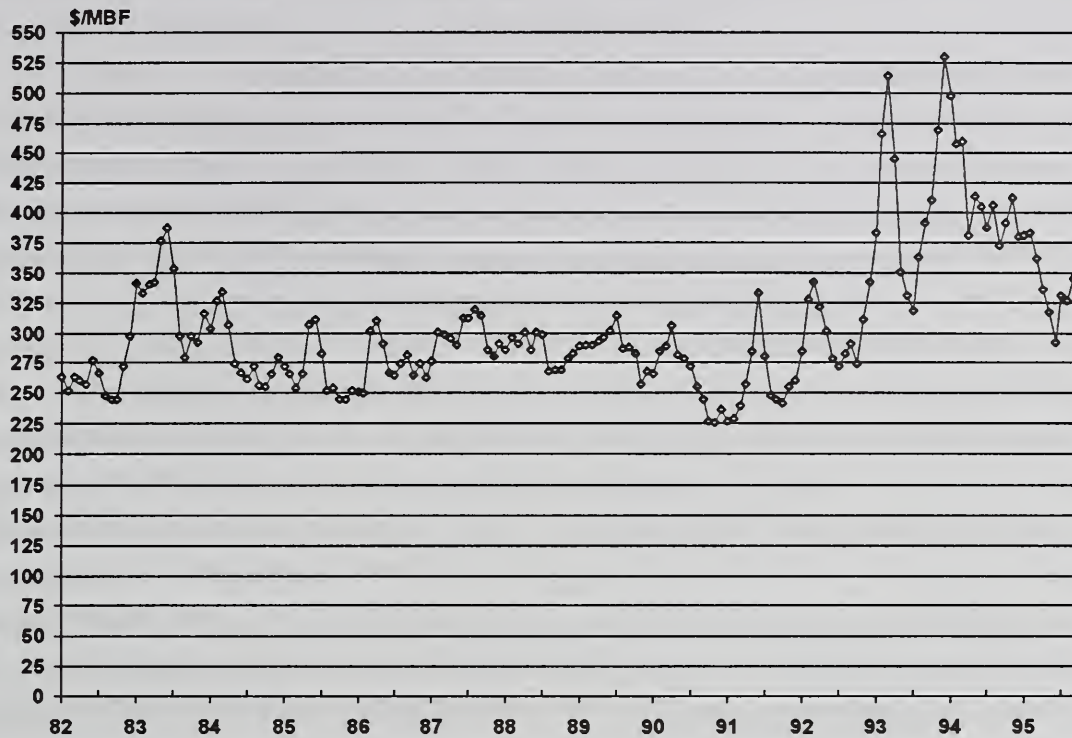
sic wood, and log "stringers". The latter refers to the logs used in bridge construction that are offered at the time the bridge is dismantled. Ranger sales of less than 200 MBF are occurring more frequently in the southern portion of Southeast Alaska. Because a large tree may contain as much as 5 MBF, smaller sales sometimes only include two or three trees. The increasing number of requests for such sales on the Ketchikan Area of the Tongass National Forest prompted both the Thorne Bay and Craig Ranger Districts to designate foresters with the primary responsibility of preparing very small timber offerings.

The Special Salvage Timber Sale (SSTS) program is another cooperative effort between the SBA and the Forest Service, established under the National Forest Management Act (NFMA). Salvage sales are those intended primarily to remove trees that are damaged, dead, or down due to insects, disease, fire, or wind throw, and to remove associated trees for stand improvement. When salvage sales are offered under this special program, bidding is limited to firms with 25 employees or less. No restriction is placed on the size of the firm that processes the timber after it is harvested.

Many of the smaller-scale wood-products manufacturers are located on Prince of Wales Island. Although individual operations may vary, they generally fall into one of three categories: 1) very small sawmills with a total capacity of less than one million board feet annually, including portable mills and mills with special-use permits for on-site processing; 2) cedar salvage, shake, and shingle producers; and 3) specialty woodworkers and producers of high-quality musical instrument components. A 1994 survey identified 31 separate entities in Southeast Alaska that process less than a million board feet of wood each year. A total of 58 people were reportedly employed by these small operations.¹⁰ Despite the high level of activity, the combined wood processing capacity for these mills is reported to be less than 3.5 MMBF.

10 Alaska Lumbermen's Association, Memorandum on the Capacity of the Southeast Alaska SBA Mill Operations, June 1994.

FIGURE 4. Price Averages for Framing Lumber in U.S. Markets



Markets for Wood Products from Southeast Alaska

The combined value of Alaskan wood product exports was nearly \$549 million for the 1995 fiscal year (Table A-4). Excluding trade between the United States and Canada, Alaska has traditionally accounted for about six percent of the softwood logs moving into Pacific Rim markets, and about five percent of the softwood lumber. At \$347.7 million in export sales, shipments of whole logs accounted for 63 percent of the total dollar value of Alaska's wood product exports. Log export values in FY 1995 were down 15 percent from last year, averaging \$641 per MBF. After hitting a decade low in 1985, Alaska's lumber export values have followed a generally upward trend (Figure 3). At \$702/MBF, prices for Alaska's lumber exports in FY 1995 surpassed last year's record high, reflecting tight wood supplies and the relative strength of the Japanese yen. Lumber export volumes, however, declined by 40 percent relative to FY 1994. The 73 MMBF of lumber exported in FY 1995 was less than one-third the volume shipped in the peak production year of 1990.

The domestic lumber market weakened and remained soft throughout FY 1995 with prices averaging 18 percent below FY 1994 (Figure 4). In response to recent shifts in wood products markets, Alaska's lumber manufacturers have steadily increased shipments to states in the Pacific Northwest. Although these trade flows are not captured in export statistics, information provided by the mill owners suggests that around 22 percent of Alaska's lumber output is shipped to domestic markets. In addition to rough-cut studs for framing, U.S. manufacturers are purchasing lumber from Alaska that fails to meet Japanese housing standards (i.e. is less than 13' in length) as well as lower grade material with a high percentage of knots and defect. These characteristics are of little consequence to the buyer as most of the wood is cut into smaller size pieces, dried, and finger-jointed. A wide range of products are manufactured from the finger-jointed mate-

rial including door and window framing, furniture, garage door pieces, doors for homes, paneling, window casing, and molding. The fine grain of Alaskan timber makes it especially well-suited for machining, and the process of finger-jointing increases the value of otherwise marginal timber.

Pulp exported from Alaska represents about 13 percent of the dissolving pulp imported by major consuming nations, including the United States. Alaska's exports of dissolving pulp were down slightly relative to FY 1994, but a phenomenal recovery of market pulp prices more than compensated for the volume reduction. Unit prices averaged a record \$915 per metric ton, 19 percent above average unit prices during the 1989 market peak. The rapid recovery from last year's market slump was nothing short of remarkable, as prices nearly doubled in a 9-month span.

Japan remains the primary market for Alaska's wood product exports, receiving approximately 62 percent of the total dollar value. In FY 1995, Japan received 96 percent of the total value of Alaska's lumber exports (Table A-6). Considerably smaller shipments were sent to South Korea and Taiwan, currently the only other significant destinations for Alaska's lumber exports. Japan also received most of Alaska's log exports, accounting for 74 percent of the total dollar value in FY 1995. South Korea (15 percent), Canada (7 percent), and Taiwan (4 percent) were other primary destinations (Table A-7). The market for Alaska's pulp is more diverse, and has included as many as 24 nations (Table A-9). Taiwan was the primary destination for Alaska's pulp exports, receiving 37 percent of the total dollar value in FY 1995. Other sizable markets, in terms of total dollar value, include China (14 percent), Japan (14 percent), Indonesia (13 percent), and West Germany (13 percent).

Japan - Market Update. Although the Japanese market is vital to Alaska's wood products industry, Alaska supplies just 2 percent of Japan's total softwood lumber imports. Japan has dominated world markets for softwood and tropical hardwood log imports for many years and is rapidly becoming one of the world's largest importers of softwood lumber. In addition, Japan's reliance on imported wood has steadily increased over the years to currently account for 78 percent of total wood consumption. Japan imported a total of 3,848 MMBF of lumber during calendar year (CY) 1994, the bulk of which was purchased from Canada (61%). Together, Canada and the United States supply over 80 percent of Japan's softwood lumber imports. Since Europe mandated kiln-drying of all lumber imports, Canadian manufacturers have shifted more wood to the U.S. and Japan.¹¹ At the same time, U.S. lumber exports to Japan have continued to decline from 35 percent of total trade volume in 1989 to 20 percent in 1994 (Table A-13).

Of the four key lumber markets in Japan (packaging and pallets, traditional housing, pre-fab housing, and industrial uses), the housing market is by far the largest and most difficult to break into.¹² Quality control is extremely important to Japanese home builders and meeting grade specifications is the number one issue for suppliers. Modern mills in urban areas need supplies of high value log imports to effectively compete, on a quality basis, with the skilled, labor-intensive production of the smaller rural mills. The combination of extraordinarily high logging costs in Japan, a growing shortage of young workers willing to live in rural locations, and log export restrictions in major supply regions, suggests a high potential for contin-

¹¹ "Canada Forced Out of European Market", *Pulp and Paper Week*, December 13, 1993, pg. 7.

¹² Bob Lewis, "Radiata Pine Products for Japan-The 21st Century", *Pacific Rim Market Report*, July 1992, pg. 4.

ued growth in Japanese lumber imports. The strength of the Japanese yen and rising labor costs, further support the expansion of finished product imports over the next few years. Both Canada and the United States have spent considerable time and money teaching Japanese contractors to build homes of 2x4 construction while exploring the prospects for trade in kiln-dried metric lumber, should these building techniques become more widely accepted.¹³

Although recessionary forces linger, the housing market in Japan appears to be making a sustained recovery. Perhaps more importantly, wood-based houses account for a growing share of new construction. Although 1994 housing starts were down 8 percent from the high of 1.7 million recorded in 1990, the number of wood-based homes declined only one percent (Table A-16). Moreover, because the average size of wood homes built in Japan has increased by 8 percent since 1990, in terms of actual floorspace, the amount of wood used in home construction has actually increased over the last four years. Although traditional post and beam construction still dominates the market, home buyers in Japan are becoming increasingly cost conscious and more accepting of North American 2x4 construction methods. The latter technique now accounts for about 9 percent of Japan's wood-based housing starts.

A number of government initiatives promise further gains to the housing sector. The average home size in Japan is about 900 square feet which compares to the U.S. average of 1300 square feet. The Government Housing Loan Corporations (GHLC) of Japan, which finances over 54 percent of all single-family homes and 33 percent of all new construction loans, has set up a preferential loan system to create larger, safer, and more durable homes. These "Top Quality Housing Guidelines" increase floor area for single family homes to 1,292 square feet. In addition, Japan's Ministry of Construction (MOC) has set goals for reducing housing costs by one-third before the year 2000 by reducing construction costs, increasing the supply of land for construction, and cutting government regulations. Measures in the MOC action program are aimed at increasing competition and streamlining distribution channels, encouraging more three-story multi-family projects, standardizing materials and construction methods, and increasing imports of lumber and housing materials.¹⁴

Environmental restrictions in the Pacific Northwest and Canada have prompted Japanese buyers to consider alternative markets and products as well as new construction techniques. In Oregon, Washington and California, the threatened species listing of the northern spotted owl has reduced the timber supply available from federal lands by about 5 billion board feet (BBF). British Columbia is following a similar path by reducing the amount of government-owned land available for commercial timber production. One projection estimates the annual allowable cut (AAC) on crown lands to drop from 14.6 BBF in 1992 to 11.8 BBF in 1996.¹⁵ Together the U.S. and Canadian harvest declines are expected to reduce the world's softwood timber supplies by 4.5 percent.¹⁶

In its search for alternative fiber supplies, Japan has turned to the Nordic countries of Sweden and Finland. Both countries have high timber export potential as only 60-65 percent of their annual growth is harvested each year. Finnish lumber producers began their cooperation with Japan in 1993 and consider this

¹³ Lewis, pg. 5.

¹⁴ Pete L. Gobroski, "Delegation Explores Opportunities for Panelized Housing in Japan", *Cintrafor News*, September, 1994, pg. 4.

¹⁵ "Canada's Timber Harvest Won't Offset U.S. Declines", *Random Lengths Export*, September 15, 1993, pg. 1.

¹⁶ Lisa Cohn, "Wood Producers Search the Globe for New Timber Supplies", *Forest Perspectives*, Winter 1994, pg. 8.

one of the most important export markets for their industry. Some producers have already invested in the Japanese market by adjusting their products to meet Japanese dimensions and standards. Sweden has since surpassed Finland in terms of volume of wood traded. Both countries work through the Nordic Timber Council, an organization dedicated to expanding the export of Swedish, Finnish, and Norwegian timber overseas. With regard to Japan, the Council is most concerned with the issues of high freight costs, Japan's strict product specifications, and the need to develop a market for their substantial stocks of redwood.¹⁷ Difficulties notwithstanding, the Scandinavian countries exported a total of 39 MMBF of softwood logs and 100 MMBF of softwood lumber to Japan from January through July of 1994.¹⁸ All indications are that Scandinavia will continue to expand its presence in the Japanese market for wood products.

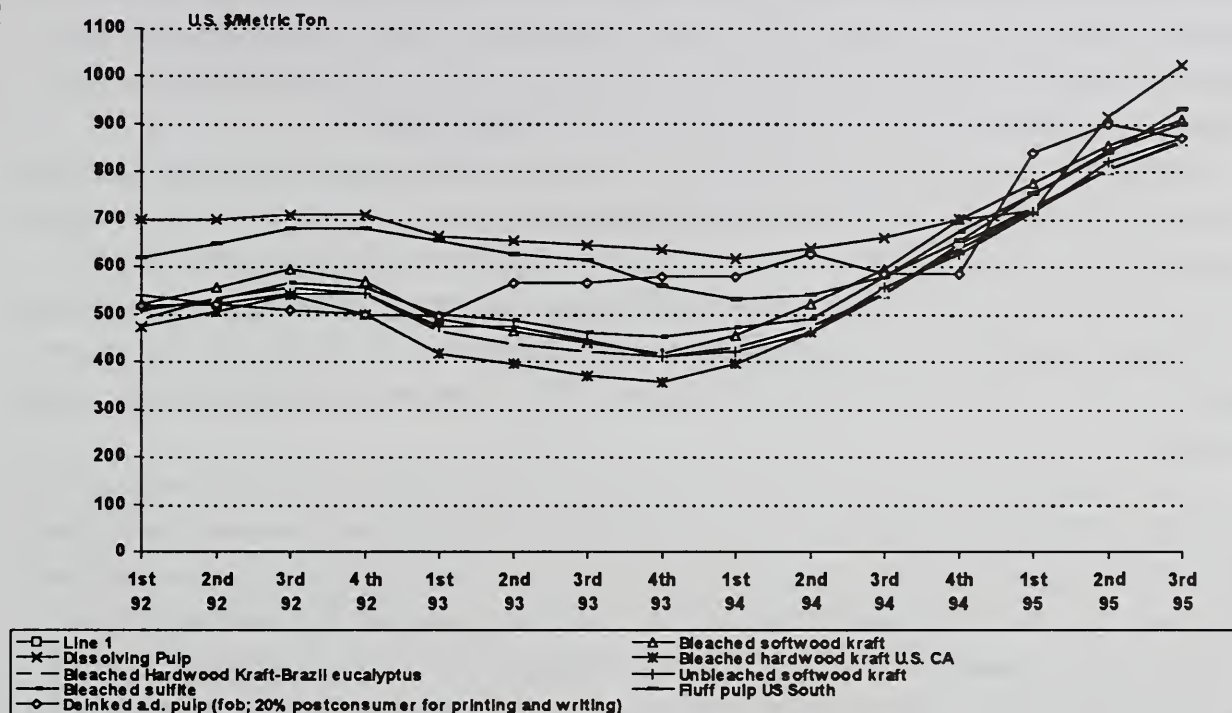
New Zealand and Chile - Competition for Alaska's Domestic Sales Facing ever-increasing wood prices in the Pacific Northwest, secondary manufacturers have intensified their search for reasonably-priced substitutes for domestic timber. As previously discussed, Alaskan producers have been able to meet some of this demand. However, an increasing amount of finished and semi-finished wood products from New Zealand and Chile are moving into U.S. markets. Both countries are well-positioned to become significant timber exporters due to relatively low production costs and a supply of timber that substantially exceeds domestic demand.

New Zealand and Chile possess considerable acreages of radiata pine plantations; approximately two-thirds of the world's total. Radiata pine plantations, with a 25 to 30 year rotation period, produce timber much faster than many other forest types.¹⁹ Together, the two countries have an estimated sustained yield of 6.2 BBF annually which is projected to increase to 10.6 BBF by the year 2010.²⁰ Although this species has had a reputation of being a low-quality resource, the focus on selective thinning and pruning of young stands in recent years is producing a large volume of clear, higher quality wood. When prices for ponderosa pine molding stock jumped to a high of \$2,615 per MBF in March of 1994, U.S. buyers were especially eager to test the acceptability of radiata pine as a substitute.²¹ The challenge for radiata pine producers is to convince buyers of the long-range acceptability of the species as a *permanent* source of wood for molding, mill work, and preservative treated timbers.

Dissolving Pulp - Market Update. Dissolving pulp, also known as "chemical cellulose", refers to a group of highly purified wood pulps, each with a different cellulose content and reactivity. The Ketchikan Pulp mill uses a magnesium-based sulfite process to manufacture pulp with a cellulose content of around 91 percent used in the manufacture of rayon and cellophane.²² Rayon is further manufactured into woven and non-woven fabrics for apparel, draperies, and upholstery. Other non-woven items include disposable diapers, and disposable medical supplies as masks, gowns, drapes and caps. Rayon is used extensively in industrial products such as tire cord, rope, twine, industrial belting, hoses, braids, bristles, insulation and

17 "Nordic Timber Council Members Visit Japan for Market Investigation", *Japan Lumber Journal*, March 20, 1994, pg. 11.
 18 "Imports of European Softwood Steadily Increasing", *Japan Lumber Journal*, September 30, 1994, pg. 8.
 19 *Marketing of Lumber, Chips, and Other Manufactured Forest Products of the Pacific Rim*, Conference Proceedings (Seattle: Jay Gruenfeld and Associates, Inc., 1992), pg. 13.
 20 Ivan L. Eastin, "Radiata Pine: A Competitive Force in Pacific Rim Markets", *Cintrafor News*, April 1993, pg. 3.
 21 Cohn, pg. 7.
 22 Irene Durbak, "Pulp Industry Market Trends", Gen. Tech. Rpt. FPL-GTR-77, (Madison, WI: USDA Forest Service, Forest Products Lab), 1993, pg. 1.

FIGURE 5. Market Pulp Prices: Delivered in U.S.



other products. There are also applications for rayon fibers in the plastics, rubber, paper, paint, electrical, chemical, and other non-textile industries. Cellophane has found widespread use as a clear packaging material for a multitude of consumer products. Another derivative of Alaska's dissolving pulp is used in diet foods, pharmaceutical and cosmetic products.²³

The productive capacity of dissolving pulp producers in the U.S., Japan, and Europe has declined over the years as rising wood costs, environmental regulation, and, in some cases, outdated technology, have put older mills into a severe cost/price squeeze. In particular, significant environmental concerns have developed in the United States and Europe with regard to the dioxin released during chlorinated pulp bleaching processes.²⁴ The Environmental Protection Agency (EPA) continues to assess the potential health hazards and modify regulations accordingly. Louisiana-Pacific Corporation, parent company of Ketchikan Pulp, has responded to these concerns by announcing plans for the nationwide conversion of all its plants to chlorine-free processing. The company announced plans to convert the Ketchikan mill to the production of totally chlorine-free pulp by 1998.²⁵

Most expansion in dissolving pulp capacity today is occurring in the developing regions of the world where pulp manufacturers have the advantage of lower labor costs and less-restrictive environmental controls when compared to North American mills. By the end of 1995, an additional 160,000 metric tons of ca-

²³ Ketchikan Pulp Company, *Our First 20 Years*, 1974, pg. 17.

²⁴ Gail Dutton, "Chlorine Fading from the Paper Scene?", *Chemical Business*, July/August 1992, pp. 30-32.

²⁵ Carl Espe, "Capital Spending Plans: 1994-96 and Beyond", *Pulp and Paper*, January 1995, pg. 73.

capacity is scheduled to come on-line at the dissolving pulp mill in Ukomaas, South Africa. This mill is reported to be the world's largest and lowest cost producer of dissolving pulp and the addition to this plant alone, will replace the capacity lost from Alaska Pulp Corporation's closure of the Sitka pulp mill (September 1993). Elsewhere, a joint-venture with Austria will operationalize a totally chlorine-free dissolving pulp mill in Brazil by the end of 1995, and Formosa Chemicals and Fibre has announced plans to build a dissolving pulp mill in China with a capacity of 90,000 metric tons per year.²⁶

The market for dissolving pulp is indirectly influenced by the market for paper pulp because conversion between the two processes is economically feasible for some producers. Lower levels of economic activity during recessionary periods reduces the demand for paper, causing the price of paper-grade pulp to fall. This prompts the conversion of some mills from paper-grade to dissolving pulp leading to overcapacity and lower prices in this market as well. The process is reversed during periods of economic recovery. Consequently, market cycles for dissolving pulp tend to lag two to three years behind turning points in the general economy.

At the end of 1992, widespread overproduction of chemical grade market pulp left producers with record inventories. Mill closures and extended downtime throughout 1993 finally pulled inventories back in line with demand but not until inflation-adjusted prices for most grades had dropped to their lowest point since the 1930's. Although the depressed world economy has kept rayon prices soft, dissolving pulp prices are relatively stable in comparison to price fluctuations in other grades of market pulp (Figure 5). By the second quarter of FY 1994, world pulp markets finally began to recover and dissolving pulp prices for in FY 1995 climbed to a record high.

There are several indications that dissolving pulp markets will remain strong over the next few months. First, mill closures and market-related shutdowns have helped to curb the oversupply. Second, the market for paper-grade pulp has made a phenomenal comeback since the end of 1993, with quarterly price hikes of \$60-\$70/ton bringing paper-grade pulp prices very near those of dissolving pulp. Thus, the impetus for mill conversion appear very strong. Third, a poor cotton crop has raised cotton prices, shifting market focus to rayon and cotton substitutes. Fourth, new technology to produce the solvent spun cellulosic fiber known as *lyocell*, may provide further growth for dissolving pulp demand. Several noted fiber manufacturers are reportedly installing and expanding their capacity to manufacture this new product.²⁷ Finally, the general improvement in world economies is likely to boost demand for dissolving pulp in traditional product lines of rayon and acetate.

²⁶ "Downtime, Closures May Not be Enough to Firm Up Dissolving Pulp Market", *Pulp and Paper Week*, August 23, 1993, pg. 5.

²⁷ Dana Milbank, "Can a New Fiber Take on Rayon?", *Wall Street Journal*, January 9, 1995, pg. B1.

Appendix A. Reference Tables

TABLE A-1.
Employment in the Wood Products Industry¹
Southeast Alaska, Fiscal Years 1981-1995

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 ⁵	1994	1995
Logging ²	1,047	991	1,010	946	1,004	1,239	1,545	1,981	2,113	2,144	1,554	1,415	1,344	1,177	1,185
Sawmill	605	540	429	395	363	331	375	468	478	500	604	538	447	515	301
Pulpmill	1,081	975	854	700	580	772	861	892	925	899	911	910	859	533	516
Total Direct Employment ³	2,733	2,506	2,293	2,041	1,947	2,342	2,790	3,341	3,516	3,543	3,069	2,863	2,650	2,225	2,002
Indirect Employment ⁴	2,125	1,950	1,800	1,600	1,500	1,825	1,950	2,350	2,550	2,570	2,226	2,077	1,935	1,624	1,461
TOTAL	4,858	4,456	4,093	3,641	3,447	4,167	4,740	5,691	6,066	6,113	5,295	4,940	4,585	3,849	3,463

¹ Figures reported here include employment related to the harvest and processing of timber from all ownerships in Southeast Alaska.

² Jobs related to logging operations, such as road construction, are counted as indirect employment.

³ Source: Alaska Department of Labor and USDA Forest Service Region 10, Ecosystem Planning and Budget

⁴ Two computer simulation models (IPASS and IMPLAN) were used to estimate indirect employment. The distinction between direct and indirect employment is a function of the Standard Industrial Classification (SIC) System used nationally for the collection and grouping of economic statistics. For purposes of this report, the wood products "industry" is defined as logging, sawmills and pulp mills. Persons employed in these occupations are reported here as "direct" employment. "Indirect" employment refers to the persons employed in all businesses supporting operation of the wood products industry. For example, the owners of a sawmill may purchase goods and services (such as power or repair services) from local merchants thereby contributing to their sales volume and employment. Other indirect jobs are supported when employees of the wood products industry spend their take-home pay in local communities.

⁵ Figures have been revised based on March 1994 benchmark.

**TABLE A-2. Volume of Timber Offered, Sold, and Harvested
Tongass National Forest, Fiscal Years 1988-1995
(million board feet, net sawlog +utility)**

	Short-Term Sales			Long-Term Contracts			Program Total				
	Offer	Sold	Harvest	Prepared	Released	Harvest	Offer/ Prepared	Re-Offer	Total Offer	Sold/ Released	Harvest
1988	92	70	100	365	266	296	387	30	417	336	396
1989	93	92	142	276	198	303	369	2	371	290	445
1990	54	26	173	331	287	298	385	22	407	313	471
1991	79	52	90	318	354	273	397	35	432	405	363
1992	40	81	72	449	357	298	489	27	516	429	370
1993	61	45	55	257	303	270	318	32	350	348	325
1994	100 ¹	52	48	207 ²	217 ²	228	307	30	337	269	276
1995	110 ³	102 ¹	59	217 ⁴	159	162	327	0	327	261	221

Note: The activities related to the long-term contracts are somewhat different than those of the short-term sale program. The following clarifications are provided in reference to the figures reported above.

Volume Offered: Under the short-term sale program, this refers to advertised volume. The volume fully prepared and available is reported here as a comparable measure for the long-term contracts.

Volume Sold: Under the short-term sale program, this refers to the volume awarded to purchasers. The volume formally released to contract holders is reported here as a comparable measure for the long-term contracts. Timber is counted as being released under the long-term contract when a timber offering has been accepted by the purchaser.

¹ 53.8 MMBF enjoined by court decision in *AWRTA v. Morrison*

² 40.9 MMBF enjoined by court decision in *AWRTA v. Morrison*

³ 67.7 MMBF enjoined by court decision in *AWRTA v. Morrison*

⁴ 57.8 MMBF enjoined by court decision in *AWRTA v. Morrison*

**TABLE A-3.
Tongass National Forest Log Exports
CY 1977-1994
(MMBF)**

1977	14.7	1986	37.4
1978	27.9	1987	39.8
1979	20.1	1988	54.4
1980	27.9	1989	48.9
1981	17.5	1990	61.2
1982	16.8	1991	35.3
1983	16.3	1992	43.7
1984	25.4	1993	39.6
1985	44.9	1994	not available

**TABLE A-4. International Exports of Alaskan Wood Products
Fiscal Years 1981-1995**

Product/Unit ¹	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Softwood Logs															
Volume (MMBF)	130.1	197.5	292.6	237.6	258.6	340.3	436.1	482.2	629.6	606.6	516.9	537.4	500.2	518.9	542.7
Value (\$MM)	68.4	95.4	128.3	97.1	99.6	137.9	179.6	261.6	310.3	350.9	293.9	327.4	362.6	391.7	347.7
Unit Value (\$/MBF)	526	483	419	408	385	405	412	543	493	578	569	609.3	725	755	641
Inflation Adjusted (\$93/MBF)	829	710	619	554	507	519	515	655	572	644	610	627	725	736	608
Lumber and Cants															
Volume (MMBF)	202.5	178.6	136.0	113.3	121.0	93.5	121.0	152.5	182.3	225.5	180.7	120.8	145.2	122.7	73.3
Value (\$MM)	60.3	62.5	45.5	32.2	32.5	24.7	33.9	52.1	71.0	85.3	74.8	50.3	74.8	67.7	51.5
Unit Value (\$/MBF)	298	350	334	284	266	264	280	342	385	378	414	416	512	552	702
Inflation Adjusted (\$93/MBF)	307	361	344	293	274	272	288	352	401	389	426	428	512	538	666
Woodchips															
Volume (Mtons)	60.5	84.8	19.0	10.5	4.5	0	0	10.4	77.9	18.2	87.8	19.49	41.3	69.1	102.1
Value (\$MM)	5.5	6.4	1.3	.3	.4	0	0	.6	3.6	1.3	7.3	1.5	4.3	8.2	15.2
Unit Value (\$/ton)	90	75	66	32	90	0	0	54	46	78	83	78	105	119	149
Inflation Adjusted (\$93/ton)	142	110	93	43	129	0	0	65	54	82	89	81	105	116	142
Woodpulp															
Volume (Mtons)	252.9	211.0	188.5	249.2	166.5	203.8	232.0	260.4	296.9	289.3	263.8	299.2	209.5	156.8	146.5
Value (\$MM)	135.7	113.3	94.8	127.3	72.0	85.4	113.9	160.4	227.7	203.4	162.2	175.0	123.3	90.1	134.0
Unit Value (\$/ton)	537	601	503	510	433	419	492	616	767	703	615	585	588	575	915
Inflation Adjusted (\$93/ton)	847	883	710	692	571	538	615	744	890	784	659	603	588	561	868
TOTAL VALUE (\$ MM)															
	269.9	277.6	269.9	256.9	204.5	248.0	327.4	474.7	612.7	641.0	538.2	554.2	564.6	557.7	548.4

¹ Export volumes are reported as millions of board feet (MMBF) or thousands of metric ton (Mtons). Values are free along ship (FAS) in millions of dollars.

² Source: Compiled from official statistics of the U.S. Department of Commerce (1995).

**TABLE A-5. Timber Harvest and Imports for Southeast and Southcentral Alaska
Fiscal Years 1985-1995**

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 ⁵	1995
(In million board feet, log scale)											
Southeast											
Public											
Tongass N.F.											
Sawtimber	162.5	251.4	282.0	331.5	377.0	399.0	299.6	303.1	268.3	221.8	181.3
Utility ^{2/}	69.5	39.1	54.2	64.7	67.6	72.0	64.6	66.6	56.7	54.0	39.8
State of Alaska											
Sawtimber	4.2	12.2	19.5	16.8	11.4	11.1	4.0	14.9	5.0	18.1	3.6
Utility	0.5	0.2	0.3	0.1	0.1	1.0	0.0	.1	0.0	2.7	2.2
BIA	0.1	0.0	0.0	0.0	3.5	0.0	7.5	4.5	0.0	0.0	0.0
Private^{3/}											
Export Sawlogs	224.4	294.1	282.5	277.0	419.8	433.7	307.2	348.7	328.2	275.0	233.9
Pulplogs	61.0	32.9	121.5	118.1	112.1	72.4	147.4	97.0	82.2	13.0	20.5
SE AK Sawlog Harvest	391.2	557.7	584.0	625.3	811.2	843.8	618.3	671.2	601.5	514.9	448.8
SE AK Total Harvest	522.2	630.0	760.0	808.2	991.0	989.2	830.3	834.9	740.4	584.6	481.3
Imports											
Sawlogs	7.8	24.4	5.7	0.1	1.8	1.2	1.2	0.0	0.0	0.0	0.0
Pulpwood logs	11.9	22.1	5.1	6.8	1.9	0.0	0.0	3.0	3.0	3.0	1.2
Wood chips ^{4/}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	34.8
SE AK TOTAL	541.9	676.5	770.8	815.1	994.7	990.4	831.5	839.4	743.4	587.6	517.3
Southcentral											
Public											
Chugach N.F.											
Sawtimber	0.7	0.8	0.7	1.0	1.1	1.1	1.1	0.5	1.7	0.0	1.1
Utility	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.0	0.0	6.5	0.8
State of Alaska											
Sawtimber	0.5	1.0	1.1	0.5	0.5	0.4	1.7	0.8	0.0	0.0	2.6
Utility	1.8	0.8	0.8	1.6	1.6	0.6	0.8	0.2	0.0	0.0	0.0
Private											
Export Sawlogs	ne	ne	44.2	79.2	120.0	105.1	134.5	123.5	127.2	186.0	210.6
Pulplogs	ne	ne	0	6.4	0.0	0.0	0.0	0.0	0.0	0.0	19.5
Southeast and Southcentral Alaska											
Harvest Sawtimber	392.4	559.5	630.0	706.0	932.8	950.4	755.6	796.0	730.4	700.9	633.1
Harvest Total	525.2	632.6	806.8	896.9	1114.6	1096.8	968.8	959.9	869.3	777.1	715.9
Harvest + Imports	544.9	679.1	817.6	903.8	1118.3	1098.0	970.0	964.4	872.3	780.1	751.9

^{1/} The federal fiscal year extends from October 1st to September 30th of the following year.

^{2/} The Forest Service requires the harvest and removal of utility volume which is in addition to the 450 MMBF Allowable Sale Quantity (ASQ) calculated in the Tongass Land Management Plan (TLMP). The ASQ is based on net sawlog volume.

^{3/} Estimate. Sources were not found for certain years or ownerships and are not estimated (ne). Some of the private harvest reported in fiscal years 1983-86 for southeast Alaska originated from southcentral Alaska, but data were not available to separate the two regions from the estimated total.

^{4/} Compiled from official statistics of the U.S. Department of Commerce. Commerce reports pulpwood imports and wood chips imports in metric tons. Cords are converted to log scale at a ratio of 2 cords per thousand board feet (MBF). Wood chips are converted to log scale at a ratio of 2.7 short tons per MBF.

^{5/} FY 1994 estimates of private harvests have been revised in this report.

TABLE A-6.
Softwood Lumber and Cant Exports from Alaska
Volume and Value by Destination
Fiscal Years 1988-1995

Volume (MBF)								
	1988	1989	1990	1991	1992	1993	1994	1995
Australia	15	0	0	0	0	0	0	0
Canada	2,064	88	16	0	657	4	0	0
Hong Kong	0	24	0	0	0	0	0	0
Iceland	245	0	0	0	0	0	0	0
Ireland	0	18	0	0	0	0	0	0
Italy	0	38	0	0	0	0	0	0
Japan	145,343	180,874	211,189	169,160	117,615	135,598	116,184	71,765
Korea, South	4,315	1,099	7,022	3,203	0	8,804	1,994	1,462
Morocco	0	0	2,379	0	0	0	0	0
Netherlands	298	0	0	0	0	0	0	0
Saudi Arabia	0	0	2,921	3,606	0	0	0	0
Taiwan	188	87	0	220	2,597	777	4,553	65
United Kingdom	36	94	0	0	0	0	0	0
World	152,504	182,322	223,527	176,189	120,869	145,249	122,731	73,291
Value (\$M)								
	1988	1989	1990	1991	1992	1993	1994	1995
Australia	\$11	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Canada	\$739	\$24	\$5	\$0	\$164	\$4	\$0	\$0
Hong Kong	\$0	\$4	\$0	\$0	\$0	\$0	\$0	\$0
Iceland	\$45	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Ireland	\$0	\$5	\$0	\$0	\$0	\$0	\$0	\$0
Italy	\$0	\$31	\$0	\$0	\$0	\$0	\$0	\$0
Japan	\$48,385	\$70,309	\$80,186	\$70,361	\$49,557	\$64,734	\$63,122	\$49,400
Korea, South	\$2,754	\$559	\$3,281	\$1,851	\$0	\$9,422	\$3,509	\$2,002
Morocco	\$0	\$0	\$770	\$0	\$0	\$0	\$0	\$0
Netherlands	\$89	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Saudi Arabia	\$0	\$0	\$555	\$701	\$0	\$0	\$0	\$0
Taiwan	\$80	\$29	\$0	\$88	\$579	\$226	\$1,094	\$58
United Kingdom	\$14	\$29	\$0	\$0	\$0	\$0	\$0	\$0
World	\$52,117	\$70,984	\$84,797	\$73,001	\$50,300	\$74,399	\$67,725	\$51,461
Unit Value (\$/MBF)								
	1988	1989	1990	1991	1992	1993	1994	1995
Australia	\$742	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Canada	\$358	\$272	\$319	\$0	\$250	\$1,049	\$0	\$0
Hong Kong	\$0	\$169	\$0	\$0	\$0	\$0	\$0	\$0
Iceland	\$184	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Ireland	\$0	\$281	\$0	\$0	\$0	\$0	\$0	\$0
Italy	\$0	\$813	\$0	\$0	\$0	\$0	\$0	\$0
Japan	\$333	\$389	\$380	\$416	\$421	\$477	\$543	\$688
Korea, South	\$638	\$509	\$467	\$578	\$0	\$0	\$1,760	\$1,369
Morocco	\$0	\$0	\$324	\$0	\$0	\$0	\$0	\$0
Netherlands	\$299	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Saudi Arabia	\$0	\$0	\$190	\$194	\$0	\$1,070	\$	\$
Taiwan	\$425	\$265	\$0	\$400	\$223	\$291	\$240	\$895
United Kingdom	\$389	\$308	\$0	\$0	\$0	\$0	\$0	\$0
World	\$342	\$389	\$379	\$414	\$416	\$512	\$552	\$702

Source: Compiled from official statistics from the U.S. Department of Commerce, 1995.

TABLE A-7.
Softwood Log Exports from Alaska
Volume and Value by Destination
Fiscal Years 1988-1995

Volume (MBF)								
	1988	1989	1990	1991	1992	1993	1994 ^{/1}	1995
Australia	18	11	0	0	0	0	0	0
Canada	70,117	38,029	12,595	15,393	4,477	2,978	1,049	78,256
China	11,647	12,259	1,326	19,132	26,049	24,528	17,329	3,775
Germany, West	11	0	0	0	0	0	0	0
Hong Kong	0	0	0	0	4,505	0	0	0
Jamaica	0	0	0	4,636	0	0	0	0
Japan	302,594	460,792	465,152	359,842	384,553	311,200	391,911	344,599
Korea, South	86,781	108,540	109,264	94,448	90,170	135,264	84,780	94,541
Taiwan	8,988	9,926	18,199	23,411	27,728	26,203	23,851	21,538
Turkey	1,822	0	0	0	0	0	0	0
World	481,978	629,557	606,535	516,862	537,483	500,173	518,920	542,710
Value (\$M)								
	1988	1989	1990	1991	1992	1993	1994	1995
Australia	\$35	\$15	\$0	\$0	\$0	\$0	\$0	\$0
Canada	\$9,313	\$8,625	\$3,924	\$4,218	\$2,049	\$697	\$597	\$24,478
China	\$3,229	\$3,735	\$548	\$11,072	\$16,562	\$15,482	\$10,269	\$1,530
Germany, West	\$17	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Hong Kong	\$0	\$0	\$0	\$0	\$3,528	\$0	\$0	\$0
Jamaica	\$0	\$0	\$0	\$3,397	\$0	\$0	\$0	\$0
Japan	\$211,450	\$252,323	\$289,217	\$231,217	\$256,811	\$256,032	\$318,520	\$255,998
Korea, South	\$33,833	\$41,315	\$47,518	\$33,456	\$33,927	\$71,055	\$47,703	\$51,963
Taiwan	\$3,778	\$4,335	\$9,628	\$10,553	\$14,782	\$19,321	\$14,599	\$13,721
Turkey	\$246	\$0	\$0	\$0	\$0	\$0	\$0	\$0
World	\$261,901	\$310,348	\$350,835	\$293,913	\$327,659	\$362,587	\$391,669	\$347,688
Unit Value (\$/MBF)								
	1988	1989	1990	1991	1992	1993	1994	1995
Australia	\$1,934	\$1,416	\$0	\$0	\$0	\$0	\$0	\$0
Canada	\$133	\$227	\$312	\$274	\$458	\$234	\$569	\$322
China	\$277	\$305	\$413	\$579	\$636	\$631	\$593	\$405
Germany, West	\$1,540	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Hong Kong	\$0	\$0	\$0	\$0	\$783	\$0	\$0	\$0
Jamaica	\$0	\$0	\$0	\$733	\$0	\$0	\$0	\$0
Japan	\$699	\$548	\$622	\$643	\$668	\$823	\$813	\$743
Korea, South	\$390	\$381	\$435	\$354	\$376	\$525	\$563	\$550
Taiwan	\$420	\$437	\$529	\$451	\$533	\$737	\$612	\$637
Turkey	\$135	\$0	\$0	\$0	\$0	\$0	\$0	\$0
World	\$543	\$493	\$578	\$569	\$610	\$725	\$755	\$641

^{/1} Data for 1994 was revised subsequent to publication of 1994 706(a) Report.
Source: Compiled from official statistics from the U.S. Department of Commerce, 1995.

TABLE A-8.
Market Pulp Exports from Alaska
Volume by Destination
Fiscal Years 1988-1995

Volume (Metric Tons)								
	1988	1989	1990	1991	1990	1993	1990	1995
Argentina	2,222	0	0	0	0	0	0	0
Austria	0	0	0	0	0	1,144	0	0
Bangladesh	0	0	966	0	966	0	966	0
Belgium	2,400	5,597	3,302	2,842	6,430	3,448	2,896	940
Canada	749	0	98	0	0	0	0	0
China	28,833	43,843	28,670	35,213	20,828	17,931	27,076	21,067
Czechoslovakia	74	417	5,656	5,611	966	0	0	0
Egypt	8,363	8,716	15,000	6,770	9,965	7,746	5,792	4,644
Finland	0	0	0	0	485	2,912	0	0
France	0	592	727	0	4,408	0	0	0
Germany, West	3,475	4,301	4,040	5,670	27,331	17,025	27,076	19,421
Hungary	0	50	0	0	0	0	0	0
India	13,389	25,482	40,893	18,584	24,192	10,815	0	4,657
Indonesia	1,998	13,560	8,711	7,267	21,332	4,850	20,257	19,525
Japan	124,989	107,896	102,751	102,238	98,722	101,009	26,671	25,434
Korea, South	5,616	6,864	13,063	6,383	0	0	0	0
Poland	6,885	8,280	5,293	1,811	0	0	0	0
Russia	0	0	0	0	0	0	0	1,932
Soviet Union	7,999	12,648	8,723	6,773	0	0	0	0
Spain	1,999	967	1,671	0	0	0	483	0
Switzerland	0	24	0	0	0	0	0	0
Taiwan	47,070	50,916	46,544	59,932	75,324	36,888	48,520	46,904
Thailand	4,387	6,532	2,907	4,353	8,225	5,821	6,746	1,929
Turkey	0	0	140	0	0	0	0	0
United Kingdom	0	171	194	352	0	0	0	0
World	260,448	296,856	289,349	263,799	299,204	209,589	156,803	146,452

Source: Compiled from statistics from the U.S. Department of Commerce, 1995.

TABLE A-9.
Market Pulp Exports from Alaska
Total Value by Destination
Fiscal Years 1988-1995

Value (\$M)								
	1988	1989	1990	1991	1991	1993	1994	1995
Argentina	\$1,341	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Austria	\$0	\$0	\$0	\$0	\$0	\$719	\$0	\$0
Bangladesh	\$0	\$0	\$845	\$0	\$539	\$0	\$533	\$0
Belgium	\$1,198	\$4,307	\$2,478	\$1,913	\$3,894	\$2,079	\$1,567	\$683
Canada	\$354	\$0	\$68	\$0	\$0	\$0	\$0	\$0
China	\$16,842	\$33,929	\$18,928	\$19,440	\$11,420	\$9,499	\$15,714	\$18,286
Czechoslovakia	\$47	\$302	\$3,789	\$3,547	\$648	\$0	\$0	\$0
Egypt	\$5,621	\$7,563	\$11,214	\$3,593	\$5,562	\$4,159	\$2,886	\$4,412
Finland	\$0	\$0	\$0	\$0	\$200	\$1,542	\$0	\$0
France	\$0	\$377	\$200	\$0	\$1,709	\$0	\$0	\$0
Germany, West	\$2,171	\$3,276	\$3,123	\$3,531	\$16,867	\$10,301	\$9,994	\$16,906
Hungary	\$0	\$38	\$0	\$0	\$0	\$0	\$0	\$0
India	\$9,043	\$21,192	\$25,213	\$9,409	\$12,910	\$5,870	\$0	\$5,344
Indonesia	\$1,199	\$5,763	\$6,366	\$4,321	\$11,770	\$2,430	\$13,301	\$17,111
Japan	\$77,010	\$82,079	\$76,688	\$69,330	\$62,091	\$63,956	\$15,827	\$18,964
Korea, South	\$3,282	\$4,684	\$7,062	\$2,567	\$0	\$0	\$0	\$0
Poland	\$4,294	\$6,780	\$4,279	\$903	\$0	\$0	\$0	\$0
Russia	0	0	0	0	0	0	0	\$1,632
Soviet Union	\$5,247	\$10,472	\$7,186	\$4,883	\$0	\$0	\$0	\$0
Spain	\$1,271	\$773	\$1,034	\$0	\$0	\$0	\$260	\$0
Switzerland	\$0	\$9	\$0	\$0	\$0	\$0	\$0	\$0
Taiwan	\$28,880	\$40,237	\$32,440	\$35,961	\$42,928	\$19,859	\$25,127	\$50,148
Thailand	\$2,597	\$5,859	\$2,320	\$2,584	\$4,363	\$2,848	\$4,903	\$530
Turkey	\$0	\$0	\$25	\$0	\$0	\$0	\$0	\$0
United Kingdom	\$0	\$73	\$133	\$253	\$0	\$0	\$0	\$0
World	\$160,397	\$227,713	\$203,391	\$162,235	\$174,950	\$123,262	\$90,111	\$134,005

Source: Compiled from official statistics from the U.S. Department of Commerce, 1995.

TABLE A-10.
Market Pulp Exports from Alaska
Unit Value by Destination
Fiscal Years 1988-1995

Unit Value (\$/Metric Ton)								
	1988	1989	1990	1991	1992	1993	1994	1995
Argentina	\$604	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Austria	\$0	\$0	\$875	\$0	\$0	\$628	\$0	\$0
Bangladesh	\$0	\$0	\$875	\$0	\$558	\$0	\$552	\$0
Belgium	\$499	\$770	\$750	\$673	\$606	\$603	\$541	\$727
Canada	\$473	\$0	\$694	\$0	\$0	\$0	\$0	\$0
China	\$584	\$774	\$660	\$552	\$548	\$530	\$580	\$868
Czechoslovakia	\$635	\$724	\$670	\$632	\$651	\$0	\$0	\$0
Egypt	\$672	\$868	\$748	\$531	\$558	\$537	\$498	\$950
Finland	\$0	\$0	\$0	\$0	\$513	\$530	\$0	\$0
France	\$0	\$637	\$275	\$0	\$388	\$0	\$0	\$0
Germany, West	\$625	\$762	\$773	\$623	\$617	\$605	\$587	\$871
Hungary	\$0	\$760	\$0	\$0	\$0	\$0	\$0	\$0
India	\$675	\$832	\$617	\$506	\$534	\$543	\$0	\$1,145
Indonesia	\$600	\$425	\$731	\$595	\$552	\$501	\$657	\$876
Japan	\$616	\$761	\$746	\$678	\$629	\$633	\$593	\$746
Korea, South	\$584	\$682	\$541	\$402	\$0	\$0	\$0	\$0
Poland	\$624	\$819	\$808	\$499	\$0	\$0	\$0	\$0
Russia	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$845
Soviet Union	\$656	\$828	\$824	\$721	\$0	\$0	\$0	\$0
Spain	\$636	\$799	\$619	\$0	\$0	\$0	\$538	\$0
Switzerland	\$0	\$375	\$0	\$0	\$0	\$0	\$0	\$0
Taiwan	\$614	\$790	\$697	\$600	\$570	\$538	\$518	\$1,069
Thailand	\$592	\$897	\$798	\$594	\$530	\$489	\$727	\$275
Turkey	\$0	\$0	\$179	\$0	\$0	\$0	\$0	\$0
United Kingdom	\$0	\$427	\$686	\$719	\$0	\$0	\$0	\$0
World	\$616	\$767	\$703	\$615	\$585	\$588	\$575	\$915

Source: Compiled from official statistics from the U.S. Department of Commerce, 1995.

TABLE A-11.
Chip Exports from Alaska
Volume and Values
Fiscal Years 1988-1995

Volume (Metric Tons)								
	1988	1989	1990	1991	1992	1993	1994	1995
Canada	0	0	3,810	0	7,790	6,277	0	0
Japan	10,437	77,918	14,355	87,767	11,700	35,054	69,067	102,084
World	10,437	77,918	18,165	87,767	19,490	41,331	69,067	102,084
Value (\$M)								
	1988	1989	1990	1991	1992	1993	1994	1995
Canada	\$0	\$0	\$134	\$0	\$203	\$134	\$0	\$0
Japan	\$559	\$3,620	\$1,285	\$7,279	\$1,343	\$4,199	\$8,216	\$15,189
World	\$559	\$3,620	\$1,419	\$7,279	\$1,546	\$4,333	\$8,216	\$15,189
Unit Value (\$/Metric Ton)								
	1988	1989	1990	1991	1992	1993	1994	1995
Canada	\$0	\$0	\$35	\$0	\$26	\$21	\$0	\$0
Japan	\$54	\$46	\$90	\$83	\$115	\$120	\$119	\$149
World	\$54	\$46	\$78	\$83	\$79	\$105	\$119	\$149

Source: Compiled from official statistics from the U.S. Department of Commerce, 1995.

**TABLE A-12. Annual Timber Harvest
Tongass National Forest 1909-1995**

Year	Volume (MMBF)	Year	Volume (MMBF)	Year	Volume (MMBF)
1909-1916 ¹	234.5	1944	86.8	1972	532.4
1917	41.0	1945	58.3	1973	590.7
1918	43.1	1946	48.6	1974	559.6
1919	37.4	1947	83.4	1975	462.4
1920	45.6	1948	81.0	1976 ³	109.6
1921	11.7	1949	49.2	1977	456.3
1922	20.6	1950	54.4	1978	414.0
1924	43.6	1951	52.9	1979	422.2
1924	48.6	1952 ²	58.0	1980	480.1
1925	53.7	1953	49.5	1981	386.7
1926	51.0	1954	66.8	1982	370.7
1927	52.0	1955	179.3	1983	250.5
1928	48.6	1956	215.8	1984	261.0
1929	48.6	1957	253.6	1985	231.3
1930	38.5	1958	195.7	1986	290.5
1931	18.2	1959	218.3	1987	336.2
1932	14.7	1960	314.8	1988	396.2
1933	14.7	1961	347.4	1989	443.1
1934	28.2	1962	339.2	1990	471.0
1935	30.5	1963	180.5	1991	363.3
1940	30.9	1964	415.7	1992	369.7
1937	35.3	1965	424.6	1993	325.0
1939	26.5	1966	439.6	1994	275.8
1939	26.5	1967	450.5	1995	221.1
1940	30.9	1968	541.3		
1941	35.8	1969	518.7		
1942	38.5	1970	493.0		
1943	73.6	1971	584.2		

Source: USDA Forest Service Region Ten, Timber Management

¹ Time period 1909-1951 reported in calendar years, net sawlog volume only.

² Time period 1952-1995 reported in fiscal years, net sawlog + utility volume

³ This is the transition quarter for the year when Congress changed the fiscal year from July 1-June 30 to October 1-September 30.

TABLE A-13. Japanese Imports of Softwood Logs and Lumber
Calendar Years 1983-1994

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
SOFTWOOD LUMBER (MBF¹)												
United States	577,622	522,354	558,725	721,678	923,680	983,549	1,112,793	1,050,406	1,019,237	896,018	857,142	788,254
Canada	849,408	817,447	916,030	882,669	1,172,328	1,337,909	1,565,897	1,568,587	1,786,722	1,870,031	2,312,241	2,338,706
Russia	54,488	61,964	64,240	71,531	76,014	94,212	110,675	112,355	101,653	95,132	120,648	148,448
New Zealand	114,863	76,458	65,531	49,583	55,909	53,006	45,025	88,153	109,214	105,311	99,636	106,894
Chile ²	0	0	0	71,268	90,662	138,648	137,990	172,456	168,125	112,858	168,719	128,897
South Seas	20,776	14,987	31,202	45,407	46,626	50,115	49,961	33,061	45,343	41,262	57,259	56,006
Other	42,709	70,379	103,381	70,215	115,553	113,803	135,177	97,381	71,495	55,648	143,056	280,995
TOTAL	1,659,867	1,563,590	1,739,108	1,912,352	2,480,771	2,771,242	3,157,519	3,122,399	3,301,791	3,176,260	3,758,702	3,848,201
SOFTWOOD LOGS (MBF¹)												
United States	1,693,721	1,586,590	1,721,419	1,836,462	2,134,399	2,072,889	2,411,951	2,255,062	1,969,603	1,863,723	1,673,622	1,602,149
Canada	162,791	263,219	304,507	315,053	414,966	261,816	193,086	112,947	89,677	163,682	107,305	65,378
Russia	1,299,021	115,466	1,103,352	1,238,568	1,217,785	1,109,627	974,361	899,102	791,052	798,072	1,002,974	980,007
New Zealand	69,015	67,467	64,955	57,384	85,867	125,668	168,394	296,545	355,151	410,763	378,877	411,008
Chile ²	0	0	0	59,568	55,271	47,623	53,261	68,894	60,451	35,667	44,387	26,042
South Seas	37,845	46,002	39,568	28,244	28,800	26,171	33,919	38,957	27,257	18,833	15,951	21,392
Other	52,543	82,444	89,060	5,052	5,847	5,680	12,813	11,112	9,972	13,205	29,649	81,264
TOTAL	3,314,936	2,160,904	3,322,861	3,540,330	3,942,934	3,649,473	3,847,783	3,682,620	3,303,165	3,303,945	3,252,765	3,187,239

Source: Wood Supply and Demand Information Service. Published by Japan Wood Products Information and Research Center, various years.

¹ Converted from cubic meters at rate of 4.53 MBF log scale /m3 and 2.36 MBF lumber tally /m³.

² Prior to 1986, imports from Chile were included in the "Other" category.

TABLE A-14.
Economic Growth and Currency Exchange Rates
Alaska's Primary Trading Partners

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
	Annual Percentage Change in Real Gross Domestic Product									
U.S.	3.2	2.9	3.1	3.9	2.5	1.2	-0.7	2.6	3.1	4.1
Japan	5.0	2.6	4.1	6.2	4.7	4.8	4.3	1.1	-0.2	0.6
Korea	6.9	12.4	11.5	11.3	6.4	9.5	9.1	5.1	5.5	8.3
Taiwan	5.0	11.6	12.3	7.3	7.6	4.9	7.2	6.5	6.1	6.2
China	13.4	9.7	10.9	11.3	4.3	3.8	8.2	13.1	13.7	12.0
	Annual Percentage Change in Consumer Prices									
U.S.	3.5	1.9	3.7	4.1	4.8	5.4	4.2	3.0	3.0	2.8
Japan	2.0	0.6	0.1	0.7	2.3	3.1	3.3	1.7	1.3	0.9
Korea	2.5	2.8	3	7.1	5.7	8.6	9.3	6.2	4.8	6.3
Taiwan	-0.2	0.7	0.5	1.3	4.4	4.2	3.6	4.5	2.9	4.1
China	8.8	6.0	7.3	18.6	17.8	2.1	2.7	5.3	13.0	21.7
	U.S. Exchange Rates-Annual Averages									
Canada (\$CA/\$US)	1.37	1.39	1.33	1.23	1.18	1.17	1.15	1.21	1.29	1.37
Japan (Yen/\$US)	236.7	167.5	144.6	128.2	138.0	144.8	134.7	126.7	111.2	102.2
Korea (Won/\$US)			822.6	731.5	671.5	707.8	733.4	780.7	802.7	803.4
China (Yuan/\$US)			3.72	3.72	3.77	4.78	5.32	5.52	5.76	8.64
Monthly U.S. Exchange Rates 1994			Monthly U.S. Exchange Rates 1995							
	Canada (\$CA/\$US)	Japan (Yen/\$US)		Canada (\$CA/\$US)	Japan (Yen/\$US)					
January	1.317	111.5	January	1.413	99.8					
February	1.342	106.2	February	1.401	98.2					
March	1.364	105.1	March	1.408	90.8					
April	1.383	103.5	April	1.376	83.7					
May	1.381	103.7	May	1.361	85.1					
June	1.384	102.7	June	1.378	84.5					
July	1.382	98.5	July	1.361	87.2					
August	1.378	99.9	August	1.355	94.7					
September	1.354	98.8	September							
October	1.350	98.4	October							
November	1.365	97.9	November							
December	1.389	100.1	December							

Source: World Economic Outlook, International Monetary Fund, May 1995 and Survey of Current Business, U.S. Department of Commerce, Bureau of Economic Analysis, September 1995.

TABLE A-15. Housing Starts in Japan

	Housing Starts				
	Total	Wood-Based	Percent Wood-Based	Average Floorspace (ft ²) Wood-Based	Average Floorspace (ft ²) Non-Wood
1965	842,596	646,536	77%		
1970	1,484,556	1,035,500	70%		
1972	1,807,581	1,111,846	62%		
1974	1,316,100	869,637	66%		
1979	1,492,926	909,582	61%		
1981	1,151,695	653,643	57%		
1982	1,146,144	666,960	58%		
1983	1,136,794	590,848	52%		
1985	1,236,072	591,911	48%	1,055	754
1986	1,364,609	633,858	46%	1,039	734
1987	1,674,300	741,552	44%	1,051	694
1988	1,684,644	697,267	41%	1,078	705
1989	1,662,612	719,870	43%	1,076	720
1990	1,707,109	727,770	43%	1,071	715
1991	1,370,126	624,003	46%	1,113	760
1992	1,402,590	671,130	48%	1,105	757
1993	1,485,684	697,496	47%	1,159	773
1994	1,570,252	721,431	46%	1,205	822
Jan-July 1994	896,509	418,556	47%	1,229	828
Jan-July 1995	821,288	372,540	45%	1,227	860

Source: Japan Wood-Products Information and Research Center, August 1995.

TABLE A-16. FY 1995 Tongass Timber Sale Offerings
(MMBF, Sawlog + Utility Volume)

INDEPENDENT SALES	Type	Volume	Notes
Broad Creek	SBA	18.903	SE Chichagof - Enjoined and not available
Hanus ATC	Ind	15.546	Kelp Bay - Enjoined and not available
Neka/Humpback Resale	Ind	33.298	SEIS 86-90 - Enjoined and not available
Tributary	SBA	.142	
Wukuklook Salvage	SBA	.419	
Spare	SBA	.187	
Lucy	SBA	.382	
Bohemia Mountain	Ind	35.529	
Sink	SBA	.156	Purchased by KPC
Bushy Salvage	SBA	.378	
Black Bear R/W	SBA	.299	
Swing	SBA	2.119	Purchased by KPC
North Ridge	SBA	.924	
Fogbank Salvage	SSTS	.180	
Top of World	SSTS	.592	
Red's Bridge	SBA	.452	
Misc. Small Sales	SBA/SSTS	1.13	
Subtotal		110.636	
- Enjoined Sales		67.747	
Total Offered and Available		42.889	
KPC CONTRACT			
East Kuiu	LT	57.798	N&E Kuiu EIS, Enjoined and not available
Chin Pt./Bushy	LT	41.514	
Little Coal Bay	LT	17.517	
East Polk	LT	14.852	
Thorne Bay 598/220-222	LT	2.580	
Thorne Bay II	LT	14.715	
Trumpeter 6	LT	3.428	
Coff-Winter 200-258	LT	11.650	
Traitors	LT	27.759	
South Margaret	LT	24.548	
Subtotal		216.361	
- Enjoined Sales		57.798	
Total Offered and Available		158.563	

TABLE A-17. Tongass Volume Under Contract 9/30/94 vs. 9/30/95
(MBF, Sawlog + Utility Volume)

Purchaser	Sale Name	10/1/94	10/1/95	Notes
Alaska Pacific Trading Co.	Granite	5,346.5	0.0	
Age, Frank	Zarembo Salvage	371.0	0.0	
Belk Logging	Shikat Plus A-Frame	161.0	105	
Big Salt Lumber	Upper Steel Salvage	72.1	0.0	
	Rockie Dog II	0.0	11	
	Rock Creek Slide II	0.0	71	
Cedarville Timber & Logging	Snowpup	3,048.0	0.0	
Chambers, Jack	Rynda Boomstick	4,546.0	1,937.3	
	8400 Line Salvage	696.0	0.0	
D&L Logging	Turnout Salvage	318.0	0.0	
	Fogbank Salvage	0.0	180.0	
	Freshwater Salvage	0.0	36.0	
Ensely, Jim	Twin	65.0	0.0	
Fox River Timber Corp.	Deep Bay South	2,904.1	0.0	
Furford, Ryan	Jubilee Cedar Salvage	15.0	0.0	
Graves, Timothy	Kitkun Bay	4,212.8	0.0	
H&L Salvage Inc.	E. Shaheen Cull Log	25.0	0.0	
	Sleepy Cedar Too	20.0	5.0	
	End of Road	0.0	30.0	
Icy Straits Lumber Co.	Wukuklook Salvage	0.0	72.2	
Kohnke, John	Froot Lake Salvage	0.0	9.0	
L&L Logging	Two View	152.0	0.0	
L.B. Logging Co.	Middle Steel Salvage	101.0	0.0	
	Split Pit Salvage	94.0	0.0	
Landers, Keith	Goose Bay Cedar II	0.0	10.0	
Last Chance Enterprises	Goose Bay Cedar	25.0	0.0	
	Rush Too/E. Rush Peak	23.0	0.0	
	Roadside Hazard Removal	10.9	0.0	
McGraw Gravel Sales, Inc.	False Island Blowdown	390.0	0.0	
Metlakatla Indian Timber Ent.	Tuxecan North	1,989.9	0.0	
	Salt Lake	2,843.5	0.0	
	Midpoint	5,328.0	2,844.0	
	Deep Bay North	14,860.0	13,661.0	
New Traditions	Sarkar Stringer	1.75	0.0	
	Buck Snort/Lab Bay	37.75	25.5	
	X-Mark Stringer	22.0	6.0	
	Staney Stringer	26.0	8.5	

	Salamander Log Salvage	0.0	8.0	
	Ratz Stringer	0.0	8.0	
	Sweetwater Log Salvage	0.0	6.0	
Rayonier, Inc.	Saginaw	0.0	24,041.0	Enjoined
Richter, Wm. Skip	Kosciusko Stringer	37.0	0.0	
	Port Alice Cull Log	59.0	59.0	
Sealaska Timber Corp.	De Rumba Salvage	585.0	0.0	
	Twenty Mile/Indian Creek	11,865.0	91.0	
Seley Corp.	East Thorne Arm	193.5	0.0	
	North Ridge Sale	0.0	924.0	
	Red's Bridge	0.0	452.0	
	Top of the World	0.0	592.0	
Silver Bay Logging	Appleton Resale	0.0	23,348.0	
	Saook	29,833.0	29,833.0	Enjoined
The Mill, Inc.	Sumner Salvage	3,105.0	1,748.0	
	11-Mile Blowdown	0.0	47.0	
Thorne Bay Lumber Enterprises	Tiny Salvage	16.0	0.0	
	Fall/Six	35.0	31.0	
	Bug Bite/RP Cull Log	36.0	6.2	
	Rio Beaver	33.0	4.0	
	North Thorne Stringer	0.0	14.0	
	Stress Salvage	0.0	10.0	
Walker Wood Products	Bonanza Cull Log Salvage	119.0	119.0	
Wilks Logging	East Polk Salvage	19.0	19.0	
Wood Marine	Cavern Stringer	6.0	0.0	
Subtotal Independent Sales		93,646.8	100,362.7	
- Enjoined Sales		-29,833.0	-53,874.0	
Available Unscaled Volume		63,813.8	46,488.7	
KPC	Offer 1	51,343	51,343	Shortfall in estimated volume
	Offer 2 Coffman/Winter	7,000	0.0	
	Offer 3 Thorne Bay	10,000	0.0	
	Offer 4 Polk Inlet	6,000	0.0	
	Offer 9 Shelter Cove	10,000	900	
	Offer 11 North Saddle	13,973	5,500	
	Offer 12 Suemez	23,921	5,250	
	Offer 13 Hume Island	5,808	5,000	
	Offer 14 Fire Cove	25,993	4,000	

	Offer 15 Upper Salt Creek	31,196	11,000	
	Offer 16 Slide/Lava	17,402	5,500	
	Offer 17 South Margaret	0.0	23,000	
	Offer 18 Traitors River	0.0	25,000	
	Offer 19 Campbell	12,540	4,000	
	Offer 20 Crab Bay	30,986	30,986	Enjoined
	Offer 21 Inbetween	9,917	9,917	Enjoined
	Offer 22 Trumpeter 6	0.0	500	
	Offer 23 Chin Pt./Bushy Pt.	0.0	41,500	
	Offer 24 Little Coal Bay	0.0	17,500	
	Offer 25 East Polk	0.0	17,000	
	Offer 26 Thorne Bay II	0.0	12,000	
	Sink Blowdown	0.0	156	
	Swing	0.0	2,119.0	
Subtotal KPC		256,079	272,171	
- Enjoined/Undercut Volume		-92,246	-92,246	
Available Unscaled Volume		163,833	179,925	

TABLE A-18.
Conversion Factors

Pulp and Chips:
Air-dried tons (ADT) to pounds = 2,000 lb/ADT
Air-dried short tons (ADST) to pounds = 2,000 lb/ADST
Air-dried short tons (ADST) to metric tons = .90718 metric tons/ADST
Bone-dry tons (BDT) to pounds = 2,000 lb/BDT
Bone-dry units (BDU) to pounds 2,400 lb/BDU
Bone-dry units to metric tons = 1.0886 metric tons/BDU
Short tons (T) to metric tons = 1.10232 T/metric ton
Metric tons to short tons (T) = .90718 metric tons/T
1 MBF round wood = 1.09 short ton pulp
1 MBF round wood = 2.7 short tons chips
.6515 ton chip by-product/MBF lumber tally produced
Logs and Lumber:
1,000 board feet (MBF), Scribner (log scale) to cubic meters = 4.53 m ³ /MBF, ls
1,000 board feet (MBF), Scribner (lumber tally) to cubic meters = 2.36 m ³ /MBF, lt
Cubic meters to 1,000 board feet (MBF), Scribner (log scale) = 0.2208 MBF/m ³
Cubic meters to 1,000 board feet (MBF), Scribner (lumber tally) = 0.4237 MBF/m ³

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